INDEX TO ILLUSTRATIONS.

American Astronomical Society, Photograph of, Berkeley, (with key) Plate XXV ..... Op. 600
Asteroids, Distribution of aphelia of the 336
ascending nodes of the 339
longitudes of perihelia of the 340
perihelia of the 335
with respect to eccentricity 338
inclination 338
mean distances from sun 333
Aurora, Photographs of the, *William Henry*, Plate XIII ..... Op. 208
Plate XIV ..... Op. 212
Chart of the heavens showing the location of 262 near stars with symbols indicating their parallax 673
Chinese Star Map, A 30, 31
Comet 1915 *a* (Mellish), Diagram of the orbit of 242
Constellation Charts 46, 102, 169, 233, 297, 371, 432, 501, 605, 681
Delavan's comet, drawn by *Alfred Rordame*, Plate III ..... Op. 15
Plate IV ..... Op. 16
photographed by *Alfred Rordame*, Plate V ..... Op. 17
Earth's Rotation, Measuring a horizontal component of the, Plate XI ..... Op. 201
the absolute magnitude of the, about a vertical axis, Plate XII ..... Op. 204
Eclipse, Annular, of February 13, 1915 37
of August 10, 1915 38
Gyroscope, The, balanced by a weight 84
revolving on a pedestal 82
The resolution of forces of 83
Jupiter in 1915, drawn by *Latimer J. Wilson*, Plate XX ..... Op. 393
Juno, Approximate path of, from February 19 to March 31, 1915 115
Korean Astronomical Chart, A, Plate X ..... Op. 193
Lick Observatory-Crocker Eclipse Expedition, General view of camp, Plate I ..... Op. 1
Instruments, Plate II ..... Op. 5
Fog in the valleys at sunset 261
The 36-inch refractor of the 263
View from the east 258
west 260
Mars, Colored drawings of, *W. H. Pickering*, Plate XXIII ..... Op. 537
Drawings of, Plates XV, XVI ..... Op. 216
Plates XVII, XVIII ..... Op. 220
Plate XXIV ..... Op. 569
Oppositions of, for fifty years 127

Meteor Trail, Photograph of a, *Joel H. Metcalf,* Plate VII.....Op. 75
Meteors, The Geminid, on December 11, 1914..... 114
Moon, Drawings showing meteorological conditions on the, *W. H. Pickering,* Plate VIII .....Op. 129 and 132
Mount Wilson Solar Observatory..... 265
Housing for the 100-inch reflector of the... 268
The glass disk for the 100-inch mirror of the 269
The 150-foot tower of the..... 267
Nebula, Spiral, *M* 51 *Canum Venaticorum,* Plate IX.....Op. 145
Neptune, Course of..... 246
North Pole, Diagram showing motion of..... 627
Orbits, Apparent, of the seven inner satellites of Saturn..... 48
Orion Nebula, Photograph of the, Plate XXI.....Op. 485
Planets, Paths of the, among the stars.....40, 41
Prismatic Astrolabe, Elements of the..... 97
Photograph of the 98
Reflections, Halley's comet, Venus and the crescent Moon, Drawn by *C. M. Cooper,* Plate VI.....Op. 65
Reflector, Latimer J. Wilson's seven-inch..... 401
Satellite of Neptune, 1915 (diagram) 44
Satellites of Jupiter, 1915 (diagram)..... 42
Mars, 1916 (diagram) 42
Saturn, 1915 (diagram) 43
Uranus, 1915 (diagram) 44
Saturn, from a painting by *R. Burnside Potter,* Plate XIX.....Op. 257
Society for Practical Astronomy at the University of Chicago, Photograph of, Plate XXII .....Op. 536
Stellar parallax, graphical illustration of.....273, 274, 275, 276
Sunspot drawn by *Alfred Rordame*.....15, 16, 17
Variable stars, Light curves of, *C. B. Lindsley*.....
.....175, 176, 177, 240, 241, 306, 379, 380, 381, 439, 440, 531, 532, 612, 613, 688
Wireless Signals, Chronographic record of.....590
Zodiacal Light, charts.....209, 211, 212

GENERAL INDEX TO VOLUME XXIII.

Abbot, C. G., The variability of the sun (abstract) 592
Absorption of light in space 125
Adams, C. E., Preliminary note on the determination of the position of the moon by photography (abstract) 593
Adams, Walter S., The radial velocities of the more distant stars (abstract) .. 593
Address by Dr. John A. Brashear, Notes on an, *V. E. Atwell* 421
Adelphi College, Outfit for astronomical instruction 697
Aethra, The orbit of, *Dinsmore Alter* 595
Agassiz Association Observatory, The 390
Aitken's measures of double stars, *Eric Doolittle* 405
Aitken, R. G., A statistical study of the visual double stars in the northern sky (abstract) 594
Algol, How to find 626
Allen, Leah B., Observations of variable stars 318
Alter, Dinsmore, The orbit of Aethra (abstract) 595
American Astronomical Society, Meeting of the 455
Report of the 17th meeting of the 18
18th meeting of the 492, 592, 629
An international gift 698
Asteroids, Numbering of recently discovered 114
The, *Elva G. Utzinger* 329
Asteroid, The apparent path of the, (3) Juno 115
Astrolabe, The prismatic, *David Rines* 96
Astronomer, The, *W. Edgar Woolard* 85
Astronomical Chart, Korea's cherished, *W. Carl Rufus* 193
fellowship of the Nantucket Maria Mitchell association 125
instruments, The section of the S. P. A. for the construction of, *Frederick C. Leonard* 319
lectureship, An endowed, *Frederick Campbell* 213
phenomena in 1915 37
teaching in the city, *Mary E. Byrd* 154, 230
Astronomy in the High School, VII, *Mary E. Byrd* 546
on the Pacific Coast, *Russell Tracy Crawford* 257
The development of, *William Haller Cassell* 393
Atwell, V. E., "Emigravit" 328
Notes on an address by Dr. John A. Brashear 421
Stella Orientis 457
Aurorae, the zodiacal light and gegenschein, Second annual report of the section for the study of the, *A. P. C. Craig* 207
Bancroft, H. C., Jr., Results of variable star observations made at West Collingswood, N. J. 378
Barnard, E. E., Photographic comparison of a bright nebula with a dark one, and the possible luminosity of space (abstract) 596
The tail of Encke's comet 14

Bauer, L. A., and *W. J. Peters*, General results of the magnetic survey of the Pacific Ocean by the Carnegie Institution (abstract) 596
Beal, A. F., Note on η Orionis (abstract) 597
Beers, Isabel, Star Gleams 460
Betelgeuse, *Frederick C. Leonard* 305
Bright lines in class B and class M spectra, *Bernard H. Dawson* 497
Brilliant object seen near the sun 449
Bruseth, Nels, Remarks on meteor observing and the Geminid meteors of December, 1914 100
Bugbee, C. F., A practical explanation of the gyroscope 81
Byrd, Mary E., Astronomical teaching in the city 154, 230
Astronomy in the High School, VII 546
Campbell, Frederick, An endowed astronomical lectureship 213
Campbell, W. W., and *J. H. Moore*, Radial velocities of the planetary and irregular nebulae (abstract) 598
The Lick Observatory-Crocker eclipse expedition to Brovary, Russia 1
Canals of Mars, On the suggested movement of the, *Percival Lowell* 478
Cannon, Annie J., The new Draper catalogue (abstract) 599
Cassell, Dr. Wm. H., Mercury visible in February 185
The development of astronomy 393
Cepheid variation, On the nature and cause of, *Harlow Shapley* 20
Chinese star map two centuries old, A, *William F. Rigge* 29
Chronographic determination of the lag between the Arlington and the Key West radio time signals, *Frank D. Urie* 589
registration of radio time signals, *Frank D. Urie* 588
Circe, The perturbations of, *D. T. Wilson* 27
Claudius Ptolemaeus, *Charles Nevers Holmes* 76
Cluster M 37 (N.G.C.2099) for proper motion, An investigation of the, *Alfred H. Joy* 603
Comet committee, Report of the, *George C. Comstock* 653
1909 I, Definitive elements of 384
1913 *f* (Delavan), Ephemeris of 113, 309, 513
1915 *a* (Mellish), ... 251, 382
Approximate ephemeris of 384
Continuation of ephemeris of 245
Diagram of orbit of 242
Elements and ephemeris of 242
Elements of 178, 382
Ephemeris of 514, 614, 690
New 177
New elements and ephemeris of 449
Provisional orbit elements of 509
Spectrum of 309
Third elements and ephemeris of 307
1915 *d* (Mellish), Diagram of orbit 689
Elements and ephemeris of 614
Ephemeris of 536, 689
New 513
Companion to α Cancri, The 625

Compton, Arthur H., A determination of latitude, azimuth and the length of the day independent of astronomical observations 199
Conference of the S. P. A., Second annual 453
society for practical astronomy 536
Constellations, How to find the, *Mary H. Dunovant, Sarah L. Mayes,* and *Sarah W. Wienges* 33
Cordeiro, F. J. B., Some problems in gravitational astronomy 409
Correction to "Meteorology of the Moon" 323
Cosmogony, Modern ideas on, *Frederick C. Leonard* 141
Cosmology, The early Babylonian, *Hector MacPherson* 562
Craig, A. P. C., Second annual report of the section for the study of the aurorae, the zodiacal light and gegenschein 207
Crawford, Russell Tracy, Astronomy on the Pacific Coast 257
Curtis, Heber D., Nebular proper motions (abstract) 599
The Lick Observatory-Crocker eclipse expedition to Brovary, Russia 1
Daniel, Zaccheus, Note on VV Orionis (abstract) 600
Dominion Observatory, Annual report for 1911 697
Douglass, A. E., Photography of the zodiacal light and gegenschein and other large faint objects (abstract) 601
The correlation of sunspots, weather and tree growth (abstract) 601
Dawson, Bernard H., Bright lines in class B and Class M spectra 497
Dean, John Candee, Mysteries of matter 537
Development of Astronomy, The, *William Haller Cassell* 393
Donati's comet and other comets, *Charles Nevers Holmes* 163
Doolittle, Eric, Aitken's measures of double stars 405
A vanished star? 625
Double stars, Aitken's measures of, *Eric Doolittle* 405
Draper catalogue, The new, *Annie J. Cannon* 599
Dunovant, Mary H., How to find the constellations 33
Earth-shine, The spectrum of the, *Frank W. Very* 649
Eclipse, The solar, of 1916 December 24-25, *W. F. Rigge* 636
Eclipses, *Marian McFadden* and *Irene Wingard* 483
"Emigravit," *V. E. Atwell* 328
Encke's comet, Ephemeris of, at opposition in 1916, *F. E. Seagrave* 244
The tail of, *E. E. Barnard* 14
Equinox, The civil date of the autumnal 124
Eros, the light curve of, in 1914, *Margaret Harwood* 602
European Astronomers, *Edward C. Pickering* 12
Evolution of a gravitating, rotating, condensing fluid, *Elliott Smith* 640
Fireball, A remarkable, *Charles P. Olivier* 189
Frost, Edwin B., New conceptions of the nebula of Orion 485
Spectroscopic binary in the trapezium of Orion 361
Gazette Astronomique resumed, Publication of the 389
The 188
Gegenschein, Second annual report of the section for the study of the aurorae, the zodiacal light and, *A. P. C. Craig* 207
Glanville, W. E., Light curves of the moon and the zodiacal light compared .. 678
The zodiacal light. Its place in the solar system 365, 427

Gravitational Astronomy, Some problems in, *F. J. B. Cordeiro*..... 409
Gulf stream of the sky, The..... 700
Gyroscope, A practical explanation of the, *C. F. Bugbee*..... 81
Gyroscopic Action, An explanation of, *C. M. Kilby*..... 152
Harwood, Margaret, The light curve of Eros in 1914 (abstract)..... 602
Holmes, Charles Nevers, Claudius Ptolemaeus..... 76
Donati's comet and other comets..... 162
Our terrestrial planet ship, the earth..... 428
Sirius..... 653
The hunter's moon..... 628
star-lighted firmament..... 349
Universe..... 479
Huggins, Lady, Bequest to Wellesley College..... 698
Hunter, S. C., A visit to the Mt. Wilson Observatory at Pasadena..... 341
Jordan, Frank C., Photographic photometry with the 30-inch Thaw refractor (abstract)..... 602
Joy, Alfred H., An investigation of the cluster M 37(N.G.C.2099) for proper motion (abstract)..... 603
Jupiter in 1914, *Latimer J. Wilson*..... 400
Photographs of the ninth satellite of, *Seth B. Nicholson*..... 632
Satellites of..... 235, 299
Jupiter's satellites, Phenomena of..... 298, 372, 434, 502, 606
Kilby, C. M., An explanation of gyroscopic action..... 152
Korea's cherished astronomical chart, *W. Carl Rufus*..... 193
Kunz, Jacob, and *Joel Stebbins,* Progress with the photo-electric photometer (abstract)..... 603
Latitude, azimuth and the length of the day, independent of astronomical observations, A determination of, *Arthur H. Compton*..... 199
Latitude Service, Note on the international, *J. G. Porter*..... 189
Leavitt, Henrietta S., A star having a large color-index (abstract)..... 629
Lee, Oliver J., Preliminary report on general stellar parallaxes in zone +45° of the Selected Areas (abstract)..... 630
and *Alfred H. Joy,* Stellar parallaxes derived from plates taken with the 40-inch refractor of the Yerkes Observatory (abstract)..... 631
Leonard, Frederick C., Betelgeuse..... 305
Modern ideas on cosmogony..... 141
The section for the construction of astronomical instruments of the S. P. A..... 319
Lewis, Anna D., Résumé of sunspot observations at Mt. Holyoke College, 1914..... 126
Lick Observatory-Crocker eclipse expedition to Brovary, Russia, The, *W. W. Campbell* and *Heber D. Curtis*..... 1
Publication of the, Vol. XII..... 63
Light curves of the moon and the zodiacal light compared, *W. E. Glanville*.. 678
Lindsley, C. B., Light curves of variable stars..... 175, 176, 177, 240, 241, 306, 379, 380, 381, 439, 440, 531, 532, 612, 613, 688
Lord's Rosse's Telescope..... 128
Lowell Observatory, An exhibit of the work of..... 188
The forty-inch reflector of..... 189

Lowell, Percival, On the suggested movement of the canals of Mars..... 478
MacDonald, Allan P., A nebular hypothesis..... 185
MacPherson, Hector, The early Babylonian cosmology..... 562
Magnetic survey of the Pacific Ocean by the Carnegie Institution of Washington, General results of, *L. A. Bauer* and *W. J. Peters*..... 596
Magnitude scales, Relation of the photographic and photo-visual, *F. H. Seares* 19
Magnitudes and colors in the Hercules cluster, *Harlow Shapley*..... 640
Maney, Charles A., New conceptions of the nebula of Orion..... 485
Mars, On the suggested movement of the canals of, *Percival Lowell*..... 478
Oppositions of, for fifty years..... 127
Report on, Nos. 8, 9, 10, 11, 12, *W. H. Pickering*.....216, 285, 461, 569, 654
Variability of 189
Martian spectrum, Intensification of oxygen and water vapor bands in the, *F. W. Very*..... 26
Mason, William Albert, The position of the sun in space..... 665
Mayes, Sarah L., How to find the constellations..... 33
McFadden, Marian W., Eclipses..... 483
The moon 160, 352
Mercury, Note on the visibility of, *Anne Sewall Young*..... 252
The transit of, *D. Henry Scarlett*..... 63
Visibility of 449
visible in February, *W. H. Cassell*..... 185
Metcalf, Joel H., A photograph of a meteor trail..... 75
Meteor, A brilliant..... 448
observations, A request for, *S. A. Mitchell*..... 632
observations for July and August, 1915, Results of *Charles P. Olivier*..... 567
observing, Remarks on, *Nels Bruseth*..... 100
trail, A photograph of a, *Joel H. Metcalf*..... 75
Meteoric Astronomy, *Charles P. Olivier*..... 356
Meteorology of the Moon, *W. H. Pickering*..... 129
Meteors, Report of the committee on, *Cleveland Abbe*..... 652
The Geminid, of December, 1914, *Nels Bruseth*..... 100
Mitchell, S. A., A request for meteor observations (abstract)..... 632
Parallax work at the University of Virginia (abstract)..... 631
Modern ideas on Cosmogony, *Frederick C. Leonard*..... 141
Moon, Meteorology of the, *W. H. Pickering*..... 129
Observing the new..... 451
Preliminary note on the determination of the position of the, by photography, *C. E. Adams*..... 593
The, *Marian W. McFadden* and *Irene L. Wingard*.....160, 352
Hunter's, *Charles Nevers Holmes*..... 628
Morehouse, D. W., Longitude of the Drake University Observatory by wireless 65
Mt. Wilson Observatory at Pasadena, A visit to the, *S. C. Hunter*..... 341
Mysteries of Matter, *John Candee Dean*..... 537
Nebula of Orion, New conceptions of the, *Edwin B. Frost* and *Charles A. Maney* 485
Photographic comparison of a bright, with a dark one, and the possible luminosity of space, *E. E. Barnard*..... 596

Nebulae and their bearing upon the problem of stellar evolution, Recent observations of the, *R. E. Wilson*..... 553
The Planetary, *Russell Sullivan*..... 149
Nebulae, Spectrographic observations of, *V. M. Slipher*..... 21
Nebular Hypothesis, A, *Allan P. MacDonald*..... 185
proper motion, *Heber D. Curtis*..... 599
Radial velocities of the planetary and irregular, *W. W. Campbell* and *J. H. Moore*..... 598
Neptune, Measures of the diameter of..... 322
W. T. Olcott..... 246
New section proposed for the S. P. A., A..... 448
Nicholson, Seth B., Photographs of the ninth satellite of Jupiter, (abstract).. 632
Ninth satellite of Jupiter, Orbit of..... 322
Nova Geminorum 126
Objective Prism, The, *Edward C. Pickering*..... 487
Observations with a sixteen-inch reflector, *Alfred Rordame*..... 15
Observatory, Longitude of the Drake University, by wireless, *D. W. Morehouse*..... 65
The new, at Oakland, Cal..... 63
Observing the new moon..... 388
Occultations visible at Washington...47, 103, 170, 234, 298, 373, 433, 503, 606, 681
Olcott, William Tyler, Monthly report of the American Association of variable star observers.....
.....53, 116, 179, 246, 310, 388, 441, 514, 616, 690
Neptune 246
Old volume of the "Sidereal Messenger," An.....449
Olivier, Charles P., A remarkable fireball..... 189
Meteoric Astronomy 356
Results of meteor observations for July and August, 1915 567
Orionis, Note on VV, *Zaccheus Daniel*..... 600
η, *A. F. Beal*..... 597
Paddock, G. F., Formulae for spectroscopic binary orbits of small eccentricity and for systems showing two spectra (abstract).... 632
The spectroscopic binary υ_4 *Eridani* (abstract)..... 633
Parallax work at the University of Virginia, *S. A. Mitchell*..... 631
Parkhurst, J. A., A new Greenwich Astrographic catalog..... 391
Periodic comet Tempel$_2$, Ephemeris of..... 441
Rediscovery of 384
Perrine, C. D., An apparent relation between the inherent radial velocities of the brighter stars and their magnitudes (abstract)..... 635
Some peculiarities in the radial velocity of brighter stars and their effect upon the solar motion (abstract)..... 636
Personal Notes.....62, 123, 187, 253, 320, 389, 451, 532, 626, 697
Photo-electric photometer, Progress with the, *Jacob Kunz* and *Joel Stebbins*.. 603
Photographic astrometry, Report of the committee on, *Frank Schlesinger*... 652
magnitudes in the Selected Areas, *F. H. Seares*..... 639
photometry with the 30-inch Thaw refractor, *Frank C. Jordan*. 602
Photography of the zodiacal light, gegenschein and other large faint objects, *A. E. Douglass*..... 601

Pickering, Edward C., European Astronomers 12
R Coronae Borealis and SS Aurigae 530
The objective prism 487
Pickering, William H., Meteorology of the moon 129
Report on Mars, Nos. 8, 9, 10, 11, 12 .....
.....216, 285, 461, 569, 654
Planetary Nebulae, The, *Russell Sullivan* 149
Planet Notes 45, 102, 168, 233, 297, 370, 432, 501, 604, 680
Porter, J. G., Note on the international latitude service 189
Potter, R. Burnside, View of Saturn in a sixteen-inch reflector 490
Power of a telescope, The, *W. E. Woolard* 362
Proctor, Mary, The quality of "seeing" in New Zealand 253
Provisional periods of three variables 504
Publications received 128, 192, 236, 458
Quality of "seeing" in New Zealand, The, *Mary Proctor* 253
Radial velocities of the planetary and irregular nebulae, *W. W. Campbell and J. H. Moore* 598
R Coronae Borealis and SS Aurigae, *Edward C. Pickering* 530
Recent observations of the Nebulae and their bearing upon the problem of stellar evolution, *R. E. Wilson* 553
Reflections, The date of the picture 184, 185, 251, 318
Reflector, Observations with a sixteen-inch, *Alfred Rordame* 15
Report of the seventeenth meeting of the American Astronomical Society... 18
eighteenth meeting of the American Astronomical Society...
.....492, 592, 629
Reviews:
A new Greenwich astrographic catalog 391
Flower Observatory, Vol IV, part 1 255
Is Venus inhabited 700
Memorabilia Mathematica 255
Moon's motion, The theory of 124
Observer's handbook for 1915 125
Publications of the Cincinnati Observatory, No. 18 627
Publications of the Lick Observatory 63
Radial velocities of five hundred stars 535
Radial velocities of nebulae in the Magellanic clouds 255
Report of the comet committee on Halley's comet 615
Star and weather gossip 628
Stars of the Southern Skies 700
Stellar movements and the structure of the universe 190
Sunlore of all ages 192
Ten years work of a mountain observatory 628
The astrophysical observatory of the Smithsonian Institution 126
The motion of the north pole 627
The north polar sequence 190
The reaction of the planets upon the sun 324
The riddle of Mars 392
Ricard, J. S., Sunspots caused by planets 86
Rigge, William F., A Chinese star map two centuries old 29
The solar eclipse of 1916, December 24-25, (abstract) 636

Rines, David, The prismatic astrolabe 96
Rordame, Alfred, Observations with a sixteen-inch reflector 15
Rufus, W. Carl, Korea's cherished astronomical chart 193
The spectra of stars belonging to class R of the Draper classification (abstract) 637
Saturn, Measures of the system of 321
Observations of 321
Observing, with field glasses 450
Satellites of 47, 103, 170
View of, in a sixteen-inch reflector, *R. Burnside Potter* 490
Scarlett, D. Henry, The transit of Mercury 63
Schlesinger, Frank, A description of the Thaw refractor of the Allegheny Observatory (abstract) 638
Report of the chairman of the committee on photographic astrometry 28
Spectrographic observations of λ *Tauri* indicating the presence of a third body in the system (abstract) ... 19
Seagrave, F. E., Ephemeris of Encke's comet at opposition in 1916 244
Variation of α Orionis 241
Seares, F. H., and *Harlow Shapley,* Color variation of the cluster-type variable RS *Boötis* (abstract) 19
Photographic magnitudes in the Selected Areas (abstract) ... 639
Relation of the photographic and photo-visual magnitude scales (abstract) 19
Section of the S. P. A., New 188
Selga, Miguel, S. J., The spectroscopic binary σ *Scorpii* (abstract) 638
Shapley, Harlow, Magnitudes and colors in the Hercules cluster (abstract) .. 640
New variables in the center of Messier 3 (abstract) 20
On the nature and cause of Cepheid variation (abstract) .. 20
Signals from U. S. Naval Observatory, Actual time of 64, 191, 256, 326, 458
Sirius, *Charles Nevers Holmes* 653
Slipher, V. M., Spectrographic observations of nebulae (abstract) 21
Slocum, Frederick, Graphical illustration of stellar parallaxes 272
Smith, Elliott, The evolution of a gravitating, rotating, condensing fluid (abstract) 640
Solar atmosphere, On pressure in, *Charles E. St. John* 18
rotation in 1914-15, *Charles E. St. John, Walter S. Adams,* and *Louise W. Ware* 641
Southern stars, The spell of the, *Ada Wilson Trowbridge* 277, 343
Spectra of gaseous nebulae, *W. H. Wright* 650
of stars belonging to class R of the Draper classification, *W. Carl Rufus* 637
Spectroscopic binaries, Orbits of 322
binary in the trapezium of Orion, *Edwin B. Frost* 361
ν_4 *Eridani, G. F. Paddock* 633
binary σ *Scorpii, Miguel Selga, S. J* 638
Spectrograph observations of λ *Tauri* indicating the presence of a third body in the system, *Frank Schlesinger* 19
Star Gleams, *Isabel Beers* 460
having a large color-index, *Henrietta S. Leavitt* 629

Star-lighted firmament, The, *Charles Nevers Holmes*..... 349
Stars, A statistical study of the visual double, in the northern sky, *R. G. Aitken*..... 594
The mean distance of the, whose radial velocity, proper motions and parallaxes have been determined, *Reynold K. Young*..... 651
The radial velocities of the more distant, *Walter S. Adams*..... 593
whose radial velocities vary, Fourteen, *Ralph E. Wilson*..... 256
Stebbins, Joel, and *Jacob Kunz,* Progress with the photo-electric photometer 603
Stella Orientis, *V. E. Atwell*..... 457
Stellar parallaxes derived from plates taken with the 40-inch refractor of the Yerkes Observatory, *Oliver J. Lee* and *Alfred H. Joy* 631
Graphical illustration of, *Frederick Slocum*..... 272
in zone +45° of the Selected Areas, Preliminary report on, *Oliver J. Lee*..... 630
Photographic determination of, with the 60-inch reflector, *Adriaan van Maanen*..... 646
Stetson, H. T., On the use of a thermo-electric photometer for the determination of plate magnitudes (abstract)..... 24
St. John, C. E., On pressure in the solar atmosphere (abstract)..... 18
Walter S. Adams, and *Louise W. Ware,* Solar rotation in 1914-15 (abstract)..... 641
Sullivan, Russell, The Planetary Nebulae..... 149
Sun, The position of the, in space, *William Albert Mason*..... 665
The variability of the, *C. G. Abbot*..... 592
Sunspot observations, Résumé of, at Mt. Holyoke College, 1914, *Anna D. Lewis*..... 126
photography at Kashmir..... 190
Sunspots caused by planets, *J. S. Ricard*..... 86
Notes on observed..... 623
The correlation of, weather and tree growth, *A. E. Douglass*..... 601
Supposed comet an asteroid..... 178
a nebula..... 509
Suspected variables, Observations of..... 301
Telephone time service at the Sydney Observatory..... 534
Telescope for Argentina, New large..... 323
Progress of work on the 100-inch..... 698
stolen, A..... 533
The great, at Potsdam, Germany..... 533
Temperatures in the atmosphere, The highest and lowest..... 323
Terrestrial Planet-ship—The earth, *Charles Nevers Holmes*..... 428
radiation, Transmission of by the atmosphere, *Frank W. Very*... 648
Thermo-electric photometer, On the use of, for the determination of plate plate magnitudes, *H. T. Stetson*..... 24
Total light from the starry sky..... 699
Townley, S. D., Designation of variable stars (abstract)..... 643
The new Algol variable 10.1914 (abstract)..... 25
The variable 6.1914 (abstract)..... 643
Trowbridge, Ada Wilson, The spell of the southern stars.....277, 343
Tucker, R. H., Comparison of the A. G. zone places with recent observations (abstract)..... 644

Universe, The, *Charles Nevers Holmes* 479
Uranus, Observations of 189
Urie, Frank D., Chronographic determination of the lag between theArlington and the Key West radio time signals 589
registration of radio time signals 588
Useless figures 319
Utzinger, Elva G., The Asteroids 329
Vanished star, A 530
Eric Doolittle 625
Van Maanen, Adriaan, Photographic determination of stellar parallaxes with the 60-inch reflector (abstract) 646
Variable, A new, 2.1915 *Cephei* 508
New, 98.1914 *Capricorni* 301
1.1915 *Piscium* 301
RS *Canum Venaticorum*, Elements of 380
nebula or what? 508
Variables, Four new 105
Provisional periods of three 504
Variable star observations 54, 117, 180, 247, 311, 385, 442, 515, 617, 691
made by *H. C. Bancroft, Jr.* 378
observers, Monthly report of the American Association of *William Tyler Olcott* ... 53, 116, 179, 246, 310, 388, 441, 514, 616, 690
6.1914, *S. D. Townley* 643
10.1914, The new Algol, *S. D. Townley* 25
RS *Boötis*, Color variation of, *F. H. Seares* and *Harlow Shapley* 19
Variable stars:
Approximate magnitudes 49, 105, 171, 236, 300, 373, 503, 607, 682
Designation of, *S. D. Townley* 643
Designation of recently discovered 110
Light curves of
233335 ST *Andromedae* 440
004435 V *Andromedae* 688
021024 R *Arietis* 613
052036 W *Aurigae* 688
143227 R *Boötis* 177
141954 S *Boötis* 381
142539 V *Boötis* 439
001755 T *Cassiopeiae* 688
230759 V *Cassiopeiae* 241
072708 S *Canis minoris* 379
134440 R *Canum Venaticorum* 380
142584 R *Camelopardalis* 381
034274 X *Camelopardalis* 306
210868 T *Cephei* 380
003179 V *Cephei* 688
021403 o Ceti 613
194632 χ *Cygni* 531
213843 SS *Cygni* 176
194348 TU *Cygni* 531

201647 U *Cygni* 532
195849 Z *Cygni* 531
163266 R *Draconis* 379
164715 S *Herculis* 241
180531 T *Herculis* 177
230110 R *Pegasi* 439
015354 U *Persei* 306
103769 R *Ursae minoris* 175
153378 S *Ursae minoris* 381
141567 U *Ursae minoris* 613
S *Ursae majoris* 306
123507 R *Virginis* 240
132706 S *Virginis* 612
Maxima of, of short period.....52, 106, 174, 239, 304, 374, 435, 507, 611, 684
Minima of, of short period.....51, 108, 172, 237, 302, 376, 437, 505, 609, 686
New, in the center of Messier 3, *Harlow Shapley*..... 20
Observations of, *Leah B. Allen*.....318
Variation of α Orionis, *F. E. Seagrave*..... 241
Very, Frank W., Intensification of oxygen and water vapor bands in the Martian spectrum (abstract) 26
The spectrum of the earth-shine (abstract)..... 649
Transmission of terrestrial radiation by the atmosphere (abstract) 648
Weinges, Sarah W., How to find the constellations..... 33
Wellesley College, Lady Huggins' bequest to..... 698
Wilson, D. T., The perturbations of Circe (abstract)..... 27
Wilson, Latimer J., Jupiter in 1914..... 401
Wilson, Ralph E., Fourteen stars whose radial velocities vary..... 256
Recent observations of the nebulae and their bearing upon the problem of stellar evolution..... 553
Wingard, Irene L., Eclipses..... 483
The Moon 160, 352
Winnecke's comet, Ephemeris of.....392, 512
Rediscovery of 384
Wolf-Rayet star and the planetary nebulae, The relation between the, *W. H. Wright*..... 27
Woolard, W. Edgar, The Astronomer..... 85
Power of a telescope..... 362
Wright, W. H., The relation between the Wolf-Rayet star and the planetary nebulae (abstract)..... 27
The spectra of gaseous nebulae (abstract)..... 650
Yerkes Observatory, Notes from..... 453
Young, Anne Sewall, Note on the visibility of Mercury..... 252
Reynold K., The mean distance of the stars whose radial velocity, proper motions and parallaxes have been determined (abstract) 651
Zodiacal light and gegenschein, Second annual report of the section for the study of the aurorae, The, *A. P. C. Craig*..... 207
The; Its place in the solar system, *W. E. Glanville*.....365, 427